

REMARKS

After entry of the instant Amendment, claims 4, 5, and 8-23 remain in the application. Claims 1-3 are presently cancelled as non-elected claims that were subject to a restriction requirement. Claims 6 and 7 were previously cancelled. Claims 13-17 and 19-23 stand withdrawn and currently amended, also as non-elected claims that were subject to a restriction requirement. Claims 13-17 and 19-23 have been amended to incorporate each of the elements of the previously-elected product claims (i.e., claims 13-17 have been amended to incorporate the elements of independent claim 4, and claims 19-23 have been amended to incorporate the elements of independent claim 5). Because claims 13-17 and 19-23 are process claims which require all the elements of the previously-elected product claims (i.e., claims 4, 5, 8-12 and 18), the Applicants are entitled to rejoinder of the withdrawn process claims upon allowance of the product claims. No claims have been added through the instant Amendment, and no new matter is added through the instant Amendment.

Claims 4, 5, 8-12, and 18 stand rejected under 35 USC § 103(a) as being unpatentable over Kushibiki et al. (European App. No. 0682271) in view of Amano et al. (USPN 5672672). As set forth in further detail below, the Applicants respectfully traverse these rejections on the basis that one of skill in the art would not have reasonably expected to have been able to arrive at the instant invention, as claimed in independent claims 4 and 5, based on the knowledge obtained from the combined teachings of Kushibiki et al. and Amano et al. when these references are considered as a whole. The Applicants further submit that, even assuming proper combination of Amano et al. and Kushibiki et al., the combined

teachings thereof are insufficient to teach each and every element of claim 5 because there is no teaching of a hydrosilation-reactive diluent (contrary to the Examiner's findings).

As the Examiner is aware, *Graham v. John Deere* provides the basic framework for performing obviousness analyses. As the Examiner is also likely aware, the Supreme Court has recently reaffirmed the standards set forth in *Graham v. John Deere* in the recent decision of *KSR International Co. v. Teleflex Inc.* (*KSR*), 550 U.S. ___, 82 USPQ2d 1385 (2007). It is well established that 35 U.S.C. §103 forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the **subject matter as a whole** would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” (Emphasis added) *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007). In *KSR*, the Court noted that “[t]o facilitate review, this analysis should be made explicit.” *KSR*, 127 S.Ct. at 1740-41, 82 USPQ2d at 1396. (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). When making an obviousness rejection, Office personnel must therefore ensure that the written record includes findings of fact concerning the state of the art and the teachings of the references applied, and it is appropriate to include explicit findings as to how a person of ordinary skill would have understood prior art teachings, or what a person of ordinary skill would have known or could have done. See MPEP 2141(II.). In fact, as succinctly summarized in MPEP 2141(II.), the focus when making a determination of obviousness

should be on what a person of ordinary skill in the pertinent art **would have known at the time of the invention, and on what such a person would have reasonably expected to have been able to do in view of that knowledge** (emphasis added).

As the Examiner surely appreciates, chemistry itself is an inherently unpredictable discipline. As such, the question of “what is obvious to a person of ordinary skill in the art” must not be answered with mere conclusory arguments relative to combined teachings of prior art references that oversimplify the ultimate question. More specifically, the mere identification of separately disclosed elements in various prior art references is insufficient, especially relative to a chemistry-based invention, to prove that one of skill in the art would have reasonably been expected to arrive at the combination due to the inherent unpredictability of chemistry. Those of skill in the art readily appreciate the general unpredictability of applications in the field of chemistry, and this mindset of those of ordinary skill in the art permeates the question of what one of ordinary skill in the art would have known at the time of the invention based on combined teachings of prior art references. As such, the teachings of references **as a whole** have a significant bearing on what would have been obvious to a person of ordinary skill in the art and provides valuable insight into both how one of skill in the art would have understood the teachings of the prior art, and what one of ordinary skill in the art would have known at the time of the invention based on combined teachings of prior art references.

Thus, it becomes necessary to analyze Amano et al. and Kushibiki et al. to determine what one of skill in the art would have learned from the combined teachings of these

references when considering these references as a whole. After all, one of skill in the art would surely study each of the references in their entirety when considering whether or not to combine the teachings thereof in the manner proposed by the Examiner to arrive at the instant invention. The Examiner has already attempted to make such an analysis, and has concluded that because the polysiloxane blend taught by Kushibiki et al. is disclosed to have high mechanical strength and heat resistance, the polysiloxane blend of Kushibiki et al. would be a particularly good blend to use in the manner taught by Amano et al. The Examiner has also concluded that because the inventions of both Kushibiki et al. and Amano et al. are drawn to the field of optical polysiloxane resin compositions, the instant invention would be obvious to one of skill in the art because the polysiloxane blend of Kushibiki et al. would impart increased commercial applicability to the invention of Amano et al.

The Applicants respectfully submit that while the Examiner has made a good faith attempt to establish what one of skill in the art would reasonably have been expected to do in view of the combined teachings of Kushibiki et al. and Amano et al., the Examiner's conclusions can only be the result of improper hindsight reconstruction of the instant invention and do not take into account the full teachings of Amano et al. and Kushibiki et al. **as a whole**. To explain, consideration of the teachings of Amano et al. as a whole reveals the following:

1) Resistance to solvents and prevention of intermixing is very important for the polysiloxanes that are selected for use in Amano et al. (see column 1, lines 55-63, column 2, lines 18-20 and lines 23 to 28)

2) Intermixing and low solvent resistance are particularly problematic for the optical waveguides, which have a core/clad structure, because intermixing causes an interface between the two layers to become unclear (see column 1, lines 58-63) and further causes fabricated optical waveguides to be smaller than the designed size (see column 2, lines 18-20); and

3) Certain polysiloxanes that were disclosed in the prior art as useful for optical waveguides were specifically disparaged in Amano et al. (see column 1, lines 55-63).

The effect of the above-referenced teachings of Asano et al. is to place one of skill in the art on notice of the importance of choosing materials that have high resistance to solvents and, therefore, that result in a low incidence of intermixing for the specific application of fabricating optical waveguides that have a core/cladding structure. The teachings of Asano et al. also apprise one of skill in the art that, although polysiloxanes have been used before for optical waveguides, those polysiloxanes are insufficient for the purposes and goals of Asano et al. and that any random polysiloxane could not be substituted for the polysiloxanes taught by Asano et al. with an expectation that the stated requirements relative to high resistance to solvents and low incidence of intermixing could be achieved.

Given the above, the Applicants respectfully submit that one of skill in the art would not reasonably have been expected to substitute the polysiloxanes taught by Kushibiki et al. for the polysiloxanes taught by Asano et al. to arrive at the instant invention as claimed. In particular, Kushibiki et al. teaches a very wide genus of polysiloxanes and, while the

polysiloxanes are disclosed for optical applications, **there is no indication whatsoever** that the polysiloxanes of Kushibiki et al. may have the required resistance to solvents and low incidence of intermixing when used to make optical waveguides having the core/cladding structure as taught in Asano et al., especially when Asano et al. specifically teaches that known polysiloxanes other than those used therein are insufficient for purposes of the invention of Asano et al. Further, Kushibiki et al. **only** describes the use of the polysiloxanes taught therein for optical lens applications, and Kushibiki et al. contains **no teaching whatsoever** of use of the polysiloxanes taught therein for optical devices comprising parts having different refractive indexes (such as the core/cladding structure of optical waveguides).

Additionally, the differences in the cross-linking reactions between the polysiloxanes required by Amano et al. and the polysiloxanes taught by Kushibiki et al. provide further evidence for why one of skill in the art would not reasonably have been expected to substitute the polysiloxanes taught by Kushibiki et al. for the polysiloxanes taught by Asano et al. In particular, Amano et al. does not disclose nor suggest any polysiloxanes that are prepared by cross-linking under the hydrosilylation reaction of an alkenyl-containing organopolysiloxane with an organosilicon compound containing silicon-bonded hydrogen atoms, specifically in the presence of a hydrosilylation catalyst. While the Applicants appreciate that the disclosure of a reference is to be considered as a whole, claims 21 and 29 of Asano et al. are particularly representative of the polysiloxanes that meet the requirements of Asano et al. relative to resistance to solvents and low incidence of

intermixing. In the context of claim 21, the organopolysiloxane containing a hydroxyl group is crosslinked by way of either a urethane reaction of the hydroxyl groups with (a) a polyisocyanate to form three dimensional urethane bonds (see column 17, lines 12 to 15, lines 37 to 40), or a condensation reaction of hydroxyl groups of the organopolysiloxane with (b) a silane compound such as alkoxysilane, (c) an alkoxide compound of Al, Ti or Zn, or (d) a chelate compound. The resulting organopolysiloxane is crosslinked through -O-SiO, O-Ti-O-, -O-Al-O- or O-Zn-O- bonds, respectively (see column 12, lines 55 to 61 of Asano et al).

In the optical waveguide of claim 29 of Asano et al., the organopolysiloxane contains functional groups such as alkyl, deuterated alkyl, halogenated alkyl, alkenyl, deuterated alkenyl and halogenated alkenyl. The organopolysiloxane is crosslinked through direct heating or irradiation with light, or through heating or irradiation with light after adding a free radical initiator such as peroxide thereto, or irradiation of high energy radiation such as a-rays, 6-rays, y-rays, X rays, synchrotron radiation and the like (see column 18, lines 65 to column 62, lines 8; column 18, lines 47 to 64).

The cross-linking mechanisms and curing mechanisms taught by Asano et al. are quite different from the hydrosilylation reaction taught by Kushibiki et al. Given the fact that Asano et al. specifically disparages certain polysiloxanes that fall outside of the scope of the polysiloxanes taught therein, and given the lack of any indication whatsoever that the polysiloxanes taught by Kushibiki et al. would have the necessary resistance to solvents and low incidence of intermixing to be suitable for Asano et al., one of skill in the art clearly

would not reasonably be expected to arrive at the instant invention based on the combined teachings of Asano et al. and Kushibiki et al.

The Examiner's rationale for substitution of the polysiloxane taught by Kushibiki et al. for the polysiloxanes taught by Asano et al. is insufficient to overcome the above-referenced requirements of the polysiloxanes used in Asano et al. In particular, while the polysiloxanes of Kushibiki et al. may have high mechanical strength and heat resistance, such properties do nothing to apprise one of skill in the art as to whether the polysiloxanes of Kushibiki et al. could be acceptably substituted for the polysiloxanes of Asano et al. One of skill in the art would clearly recognize that Kushibiki et al. does not answer the question of whether or not the polysiloxanes taught therein could be acceptably substituted for the polysiloxanes of Asano et al. Given the extreme breadth of known polysiloxanes, and the absence of any indication that of any indication within Kushibiki et al. that the polysiloxanes taught therein could satisfy the requirements of the polysiloxanes set forth in Asano et al., especially given the disparagement of other polysiloxanes within Asano et al., it is clear that one of skill in the art with knowledge of the combined teachings of Asano et al. and Kushibiki et al. would **not** have been reasonably expected to arrive at the instant invention as claimed. In effect, the disclosure of Asano et al. amounts to a teaching away from the combination of Asano et al. and Kushibiki et al. relative to the instant invention as claimed. For these reasons, the Applicants respectfully submit that the obviousness rejections of independent claims 4 and 5 over the combined teachings of Asano et al. and Kushibiki et al.

must be withdrawn, and that these claims, as well as the claims that depend therefrom, are novel, non-obvious, and in condition for allowance.

Relative to independent claim 5, in particular, the Examiner has not even established that the combined teachings of Asano et al. and Kushibiki et al. teach each and every element of this claim (as still required to establish a *prima facie* case of obviousness). In particular, claim 5 claims the reaction product of (A) the organopolysiloxane resin having the claimed formula, (B) the organosilicon compound having two or more hydrogen atoms, and (d2) the hydrosilation-reactive organosiloxane-based diluent. To find component (d2) in the teachings of Kushibiki et al., the Examiner has relied on the fact that $\text{ViMe}_2\text{SiO}_{1/2}$ is disclosed in the Reference Example in column 5, lines 5-30. However, it is clear that the $\text{ViMe}_2\text{SiO}_{1/2}$ is **merely a unit that is present in the resultant polymer that is formed in the Reference Example**. More specifically, the Reference Example describes the formation of a polymer that has $\text{PhSiO}_{3/2}$ and $\text{ViMeSiO}_{1/2}$ units, which if anything can only be equated to (A) the organopolysiloxane resin of claim 5 because those units are all part of the same polymer. Notably, in Example 1, the polymer of the Reference Example is mixed with a phenyltris(dimethylsiloxy) silane, which has silicon-bonded hydrogen atoms and, which if anything, can only be equated to (B) the organosilicon compound of claim 5. Clearly, there is nothing disclosed in Kushibiki et al. that satisfies (d2) of claim 5 such that neither Asano et al. nor Kushibiki et al. teach each and every element of claim 5, as required to establish a *prima facie* case of obviousness. As such, the Applicants submit that the obviousness

rejection of claim 5 must further be withdrawn on this basis, and that claim 5 as well as the claims that depend therefrom is both novel, non-obvious, and in condition for allowance.

In view of the foregoing, the Applicants respectfully submit that independent claims 4 and 5, as well as the claims that depend therefrom, are in condition for allowance, which allowance is respectfully requested. Although no fees are believed due, the Commissioner is authorized to charge Deposit Account No. 08-2789 for any fees or to credit the account for any overpayment.

Respectfully submitted,

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